Backcasting future visions on adaptation to floods and droughts

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Traditional water resources management

- Technological fixes proved to be very efficient in the short-run
- Environmental problems dealt with in isolation
- Potentially undesirable long-term consequences disregarded
- "command-and-control" management paradigm

Inability to cope with the uncertainties associated with:

- Ecological systems (ES) are self-organising complex adaptive systems (Gunderson and Holling, 2001)
- Limited ability to predict future key drivers influencing the functioning, behaviour and responses of ES (Scheffer & Carpenter, 2003)
- Limited predictability of ES, its historical trends and the system elements and interactions, incl. nonlinearities, feedback loops, and delays (Folke et al., 2005) .
- Lack of knowledge due to limited availability and variability of data.

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Today's key challenges in environmental science & policymaking often pertain future considerations about a certain state of ES (e.g., Alcamo, 2008):

- To what state is the ES concerned moving?
- Which driving forces will most influence its state in the future?
- How could current environmental problems deteriorate or improve or what new problems will emerge?
- What future policy measures could improve environmental problems?
- How to solve an environmental problem without compromising long-term sustainability & the ability to adapt to and shape change

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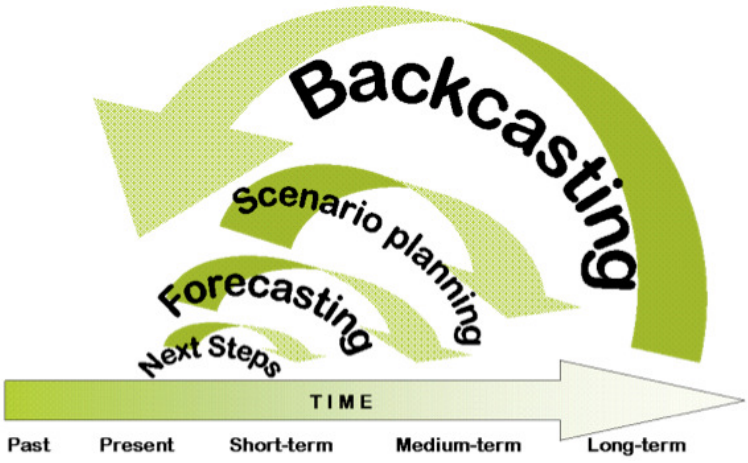
Methodologies for exploring the future (Sondeijker et al., 2006)



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Limitations of forecasting scenarios:

- Projective by nature, using trend extrapolation & quantitative historical data (Quist, 2007)
- Extrapolating trends of the past into the future is quite complex (e.g., climate change)
- Unable to fully account for the complexity of environmental issues

  - trend extrapolation, cross-impact analysis, simulation & technological forecasting models lead to feasible and relatively surprise-free futures (Sondeijker et al., 2006)

  - Scenarios not more than statistical predictions of end state descriptions (Schoemaker, 1993)
- Reliability only secured in the short-term and in cases of well defined and relatively stable systems like markets (De Laat, 1998; Berkhout et al., 2002)
- Forecasting relies on dominant trends and therefore unlikely to generate solutions based on breaking trends (Dreborg, 1996)

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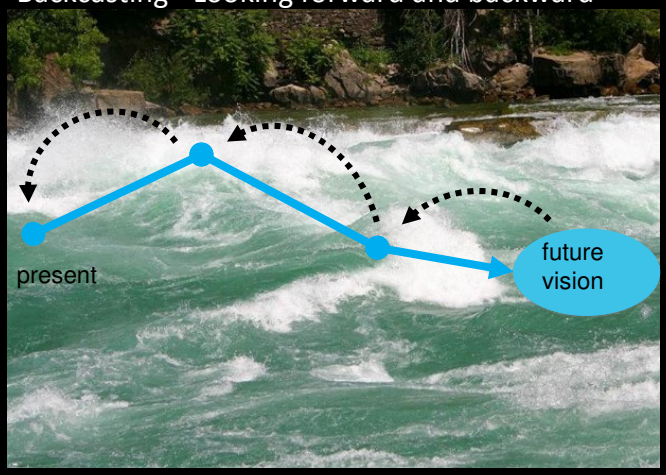
Backcasting - Looking forward and backward



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Why a visioning-backcasting approach?

- Better suited to address long-term complex problems and sustainability solutions
- Normative nature accounts for dominant human perceptions of what is possible or impedes radical change (Robinson, 1988).
- Not only about how desirable futures can be accomplished but also how to avoid or anticipate to undesirable futures (Robinson, 1990)
- Persisting trends are part of the problem

  - Existing trends are approaching an unfavourable state (e.g., climate change => ecosystem state)

  - Generate solutions based on breaking trends
- Allows a long-term time horizon to define priority problems & explore priority policy actions (approx. 50 yrs)
- Allows an integrated & systems approach to develop a whole systems change

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<u>Key features of a guiding vision:</u>

•Mental image & creative flash of insight into an attainable future triggering new policy developments (Mambrey & Tepper (2000)

•Shared multi-actor construction synchronising actions & interactions among actors (Grin & Grunwald, 2000)

•Developed in structured social interaction contexts where actors will not easily change their basic assumptions and visions (Beck, 1977:58)

- A communication medium (Luhmann, 1995)

•Emphasises important role of (un)learning regarding existing dominant views about the future and how to defy the hegemony of these views (Robinson, 1988)

•Competing guiding visions may onset a paradigm shift

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Visioning for supporting a paradigm shift to adaptive water management

- A management paradigm: *"a set of assumptions and visions about the nature of the systems to be management, the management goals & goal fulfillment; is shared by an epistemic community of actors involved in water management; is embodied by artefacts such as technical infrastructure, planning approaches, engineering practices and the like (Pahl-Wostl et al, 2008)"*.

- A paradigm concerns a long-term scheme for a continuous validity assessment of concepts such as guiding visions for sustainability, through which it assesses itself (cf. Kuhn, 1976)
- A systematic approach for improving management policies & practices by learning from the outcomes of implemented management strategies
- Alternative water management approaches cannot be realised without changes in the governance structure (cf. Pahl-Wostl et al., 2007)

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Visioning case study: flood management in New Orleans

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Horizon Initiative Water Management Committee

- Non-profit initiative
- Network of individuals representing a broad array of public & private organisations and local universities
- Monthly venue for its members to address and reflect upon a variety of policy topics
- Expand its network through public and private sector partnerships
- Supports the City of New Orleans in transitioning towards new directions on a variety of policy topics => Water Management Strategy (WMS)
- WMS to develop an integrated management programme for storm water drainage, wastewater, ground water & flood control
  - Reduce future flood damages & recovery time and cost
  - Assist in securing infrastructure funding
  - Accrue public benefits

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Aim of the study: to further advance the Committee's strategic planning effort:

- To arrive at a shared vision for water management in New Orleans
- To evaluate objectives for inclusion in a Water Management Strategy
- To assess priorities for advancing the shared vision and objectives
- To identify structural barriers preventing the vision from being achieved
- To align the capacity of the organisations that committee members represent with the vision and objectives

Methodologies:

- Expert interviews
- Visioning exercise through online survey
- Literature review

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A shared vision for water management in New Orleans

Dutch Dialogues

- Living with the water: safety and amenity from water are crucial to a future in which New Orleans is robust, vibrant and secure

Master Plan – "New Orleans 2030: A Vision for the 21st Century"

- A holistic community standard of resilience from flooding and other hazards

Green Collaborative

- Manage Water Resources to Protect Against Flooding and Restore Coastal Wetlands
- Create Attractive, Healthy, Walkable Neighbourhoods
- Green Local Government

Mayor Landrieu's Transition Team - Flood Protection and Coastal Restoration Task Force

- Enhance the security of our coastline and structural defences and to protect the City from floods
- World Class Urban Water Management

Flood Protection Alliance

- Inner Levees, Inner Peace (Polders)

Lake Pontchartrain Basin Foundation and Coalition to Restore Coastal Louisiana

- Multiple Lines of Defence

LACPRA Master Plan

- Sustain Louisiana's coastal ecosystem, safeguard coastal populations, and protect vital economic and cultural resources

GreeNOLA

- To ensure that coastal areas and habitat in Orleans Parish are conserved for future generations

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A shared vision for water management in New Orleans

Vision	Counts
Combination of all visions	10
The Dutch Dialogues	9
The New Orleans Master Plan	5
LACPRA Master Plan	4
Mayor Landrieu's Transition Team	4
Lake Pontchartrain Basin Foundation	1
Flood Protection Alliance	2
The 2010 Orleans Parish Hazard Mitigation Plan	1

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Evaluation of WMS objectives

- Reduce flood hazards to people & property
- Develop flexibility and adaptive management capacity
- Develop long-term construction, operations and maintenance plans for water infrastructure
- Reduce routine and major flood event damages
- Enable better groundwater management
- Minimise soil subsidence
- Develop hydraulic and hydrologic framework of Orleans Parish water system
- Ensure regulatory compliance
- Protect public health and safety
- Use storm water as resource
- Reduce energy use and emissions
- Enhance recreational opportunities and improve overall
- Protect and improve environmental quality and well-being
- Develop related materials and resources for public outreach
- Nurture exportable water management business models

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Structural barriers preventing the vision from being achieved

Rank	Structural barrier
1	Existing leadership
2	Lack of community coalition behind vision
3	Physical constraint of land
4	Existing regulatory codes
5	Existing governance structure
6	Funding
7	Other

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Priorities for advancing the shared vision and objectives

Rank	Methodology
1	Create a market for water management products and services
2	Reach out to existing water management government agencies to advocate water management strategy
3	Identifying agenda for advocacy of governance reform
4	Conduct research and seek best practices
5	Building broad community support for vision through an education and outreach campaign
6	Develop demonstration projects
7	Pursue grant opportunities for water management planning
8	Other

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Organisational capacities of the Committee

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A paradigm shift

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Key challenges

- Integration of multiple visions & learning processes
  - Social learning for improved decision-making on a variety of water policy topics are largely lacking
- Lack of sustainable decision making for water management
  - Historical burden of environmental and social-economic trade-offs inequitably addressed in management practices
  - Financial rates of returns of infrastructural investments prevail over social rates of returns and ecological costs
  - History of water privatisation in New Orleans is scarred by underachievement and failure
  - Residents not willing to pay to avoid and/or compensate for negative externalities of past, current and future management practices
- Lack of an integrated & systems approach to water management
  - Lack of joint decision modelling effort of policymakers & stakeholders in making sustainable trade-offs

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Conclusions

- Adopt long-term sustainability orientations
  - Equitable trade-offs between social-economical & environmental considerations
- Adopt a systems & integrated approach to water management
  - Cope with the complexity of water management issues & SES
- Institutionalise learning processes for adaptive water management
  - Address & learn how to cope with uncertainties in decision-making on a variety of water policy topics
- Identify windows of opportunities for new policy developments
  - Fusion of individual horizons to connect actors from different backgrounds and knowledge fields or disciplines
- Ambition entrepreneurial leadership
  - Seize windows of opportunities for reshaping the policy agenda & valorising them